Xinyu Cheng
Ph.D. in Mathematics

PERSONAL DETAILS

Address	Room 406, No.5 Building, Fudan University, Shanghai, China
Mail	xycheng@fudan.edu.cn
Webpage	https://sites.google.com/view/xycheng
Phone	+86 15962971901

EDUCATION

Doctor of Philosophy in Mathematics 2021/08
University of British Columbia
Area: Analysis, dynamics and numerics in PDEs
PhD Thesis: Analytical and numerical results for phase field, implicit free boundary, and fluid models.
Advisers: Prof. Li, Dong & Prof. Wetton, Brian

Masters of Science in Mathematics 2017/08
University of British Columbia
Area: Analysis, dynamics and numerics in PDEs
MSc Thesis: On the Stability of a Semi-Implicit Scheme of Cahn-Hilliard Type Equations.
Advisers: Prof. Li, Dong & Prof. Wetton, Brian

Bachelor of Science in Mathematics 2015/06
The Chinese University of Hong Kong
Areas: Computational & Applied Maths; Enrichment Stream in Maths.

WORKING EXPERIENCE

Young Principal Investigator 2023-present
Research Institute of Intelligent Complex Systems at Fudan University

Postdoc Fellow 2021-2023
the School of Mathematical Sciences at Fudan University
Host: Prof. Lei, Zhen.

Full-time Instructor 2018-2019
Department of Mathematics, University of British Columbia
Math 110/001: Differential Calculus 2018-2019 Winter term 1

Full-time Teaching Assistant 2015-2021
Department of Mathematics, University of British Columbia

ACADEMIC VISITS AND EVENTS

Invited speaker at the Fourth international symposium on modeling, analysis and applications in biomathematics   2024/06

Harbin Engineering University   *Harbin, Heilongjiang, China*

Invited speaker at nonlinear analysis seminars   2024/06

Wuhan University of Technology   *Wuhan, Hubei, China*

Seminar talk speaker   2023/11

Institute of Mathematical Sciences, ShangTech University   *Shanghai,China*

Seminar talk speaker   2023/07

School of Mathematics, South China University of Technology   *Guangzhou, Guangdong, China*

Invited minisymposium speaker at CSIAM 2022   2022/09

China Society for Industrial and Applied Mathematics   *Guangzhou, Guangdong, China*

Academic Visitor   2021/02-2021/04

South University of Science and Technology of China   *Shenzhen, Guangdong, China*

Invited speaker at Workshop on Analysis and PDE   2019/08

Tianjin Center for Applied Mathematics (TCAM)   *Tianjin, China*

Academic Visitor   2019/06-2019/07

Tianjin University   *Tianjin, China*

Invited minisymposium speaker at SIAM Conference on Applications of Dynamical Systems   2019/05

Society for Industrial and Applied Mathematics   *Snowbird, UT, US*

Academic Visitor   2018/07

South University of Science and Technology of China   *Shenzhen, Guangdong, China*

Academic Visitor   2018/04

Michigan State University   *East Lansing, MI, US*

PIMS Graduate Mathematical Modelling in Industry Workshop   2016/08

Pacific Institute for the Mathematical Sciences   *Vancouver, BC, Canada*

GRANTS

Fudan University

- National Natural Science Foundation of China, Young Scientists Fund (**30W**) 2024-
- Natural Science Foundation of Shanghai, General Projects (**20W**)   2024-
- China Postdoctoral Science Special Fund, In-Station (**18W**)   2022-2023
- China Postdoctoral Science Fund, General Projects (**8W**)   2022-2023
- International Postdoctoral Exchange Fellowship (**40W**)   2021-2023
- Shanghai "Super Postdoc" Incentive Plan (**20W**)   2021-2023

HONORS & AWARDS

the University of British Columbia

President's Academic Excellence Initiative PhD Award	2020,2021
International Doctoral Fellowship	2017-2021
International Doctoral Fellowship Tuition Award	2017-2021
International Tuition Award	2015-2017
Faculty of Science Graduate Award	2015-2017

the Chinese University of Hong Kong

First Class Graduate Honor	2015
Morningside College Master's List	2014-2015
Science Faculty Dean's List	2014-2015
Morningside College Exchange Scholarship	2013
Wei Lun Exchange Scholarships	2013
Weishan Lake Academic Scholarship	2012,2013

RELEVANT SKILLS

Software:	LATEX, MATHEMATICA, MS OFFICE, VISUAL STUDIO
Programming:	C++, C, MATLAB

PUBLICATIONS

Published and Accepted

1. *On the Spectral Gap of a Square Distance Matrix,* joint with D. Li, D. Shirokoff and B. Wetton, J Stat Phys, 2017, 166(3-4), 1029–1035.

2. *Asymptotic Behaviour of Time Stepping Methods for Phase Field Models,* joint with D. Li, K. Promislow and B. Wetton, J Sci Comput, 2021, 86(3), 1–34.

3. *On a parabolic Sine-Gordon model*, joint with D. Li, C. Quan and W. Yang, Numerical Mathematics: Theory, Methods and Applications, 2021, 14(4), 1068–1084.

4. *Non-uniqueness of stationary weak solutions to the surface quasi-geostrophic equations,* joint with H. Kwon and D. Li, 2021, Commun. Math. Phys. 388, 1281–1295.

5. *Global wellposedness for 2D quasilinear wave without Lorentz*, joint with D. Li, J. Xu and D. Zha, Dynam. Part. Differ. Eq., 2022, 19(2) , 123-140.

6. *On the equivalence of classical Helmholtz equation and fractional Helmholtz equation with arbitrary order*, joint with D. Li and W. Yang , to appear in Comm. Contemp. Math.

7. *Equivalent formulations of the oxygen diffusion problem and other implicit free boundary value problems and implications for numerical approximation*, joint with Z. Fu and B. Wetton, Siam J. Appl. Math., 2023, 83(1), 52-78.

8. *On the global well-posedness and scattering of the 3D Klein-Gordon-Zakharov system*, joint with J. Xu, Calc. Var. Part. Diff. Eqn., 63(17), 2024.

9. *Localization for general Helmholtz*, joint with D. Li and W. Yang, to appear in J. Diff. Eqn.

Preprints

1. *Unconditionally stable exponential integrator schemes for the 2D Cahn-Hilliard equation,* preprint, submitted.

2. *Energy stable semi-implicit schemes for the 2D Allen-Cahn and fractional Cahn-Hilliard equations,* preprint, submitted.

3. *Energy stable semi-implicit schemes for the 3D Allen-Cahn equation,* preprint, submitted.

4. *Second order energy stable semi-implicit schemes for the 2D Allen-Cahn equation,* preprint, submitted.

5. *On a Sinc-type MBE model,* joint with D. Li, C. Quan and W. Yang, submitted to Siam J. Appl. Math. ArXiv:2106.16193.

6. *Uniform boundedness of the highest norm for 2D quasilinear wave,* joint with D. Li and J. Xu, submitted. ArXiv:2104.10019.

7. *Energy stability and convergence of Strang splitting method for Cahn-Hilliard equation,* joint with D. Li, in preparation.

8. *Global well-posedness for 2D quasilinear wave equations with non-compactly supported initial data,* joint with D. Li and J. Xu, preprint.

9. *Global well-posedness of a two dimensional wave-Klein-Gordon system with small non-compactly supported data,* submitted. ArXiv:2312.00821.

ACADEMIC SERVICE

I have refereed articles for publications in Physica Scripta, IMA Journal of Numerical Analysis, Advances in Computational Mathematics, Fractional Calculus and Applied Analysis, Dynamics of Partial Differential Equations.